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ABSTRACT

This study explored ways in which students obtained efficacy perceptions of self-regulated learning. High school students (N=297) were self-administered American College Testing Assessment (ACT) practice examinations and Bandura's self-regulated learning subscale with specific reference to English and mathematics. Path analytic results suggested that these students depended primarily on external comparisons rather than on internal comparisons in determining their efficacy for self-regulated learning. This pattern was consistent for both female and male students. The strong association between the English and mathematics efficacy components may also provide some insight into the structure of self-regulated learning among students in academic settings. (Contains one figure, one table, and eight references.) (Author)

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ED 420 704

# Student Use of Internal and External Comparisons in Determining Efficacy for Self-Regulated Learning

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Abstract

This study explored the ways in which students obtained efficacy perceptions of self-regulated learning. High school students (N = 297) were self-administered ACT practice examinations and Bandura's self-regulated learning subscale with specific reference to English and mathematics. Path analytic results suggested that these students depended primarily on external comparisons rather than on internal comparisons in determining their efficacy for self-regulated learning. This pattern was consistent for both female and male students. The strong association between the English and mathematics efficacy components may also provide some insight into the structure of self-regulated learning among students in academic settings.

# Student Use of Internal and External Comparisons in Determining Efficacy for Self-Regulated Learning

Research has demonstrated that a self-regulating capability to direct one's own learning strongly contributes to academic achievement (Bandura, 1997). Therefore, the question of how educators might encourage student efficacy perceptions of self-regulated learning is of great interest. Research to answer this question has tended to identify individual strategies and personal characteristics of effective self-regulated learners (Schunk & Zimmerman, 1994) rather than focusing on how efficacy perceptions are formed. Further, due to differences in self-regulated learning across disciplines (VanderStoep, Pintrich, & Fagerlin, 1996), research is needed to determine if student formation of judgments concerning self-regulation is domain-specific. The current study determined the ways in which students cultivated efficacy perceptions in English and math in an effort to increase our understanding of self-regulated learning.

Bandura (1991) has provided two important factors in the judgmental component of self-regulation; self-comparison and referential comparison with others. Both personal standards and performance knowledge contribute to self or internal comparisons. External comparisons are obtained by referencing the performance of peers. An internal/external frame of reference theory (Marsh, 1986) was developed to assess the degree to which students use both types of comparisons in determining academic self-concept. The present study assessed the "frames of reference" used as students obtained efficacy perceptions of self-regulated learning (ESRL) in English and math.

The theoretical model developed to explain the frame of reference theory (see Figure) posits that use of external comparisons should produce a substantial positive correlation between English and math achievement, as well as strong positive direct effects for both English achievement on English ESRL and math achievement on math ESRL.

A weak negative direct effect of English achievement on math ESRL and math achievement on English ESRL would result from an internal comparison process. Theoretically, a combination of external and internal comparisons, where positive and negative effects interact to cancel each other out, should produce a near-zero correlation between the English and math ESRL components.

## Method

Participants (N = 297) included juniors or seniors from predominantly White, middle-class public high schools across Oklahoma. All students were attending a day-long university-sponsored ACT preparation workshop. During this workshop, they completed self-administered surveys assessing both self-regulated learning perceptions and academic achievement with specific reference to English and math. Measures included Bandura's (1989) self-regulated learning subscale from his Multidimensional Scales of Perceived Self-Efficacy. Students responded to eleven items (e.g., organizing schoolwork, participating in class discussions) rated along a 7-point scale where high scores indicated greater efficacy for self-regulated learning. Student achievement was measured with ACT Assessment sample tests consisting of actual but retired items (44 English, 30 math). Scores on these standardized practice exams are more defensible as valid and reliable measures of academic performance than GPAs or other local achievement indices which often vary across instructors, schools, or academic settings.

## Results

Coefficient alpha estimates of the ESRL scales revealed high internal consistency reliability (English = .90; math = .93). The pattern of relationships theoretically expected when students use both internal and external comparisons (see Figure 1) was then tested with conventional path analysis. As anticipated (Marsh, 1990), English and math achievement was significantly, positively related ($r = .302$; $p < .001$). Student use of external comparisons was evidenced by the achievement association, and by the strong positive effect of English achievement on English ESRL ($\beta = .263$; $p < .001$), and the strong effect of Math achievement on math ESRL ($\beta = .307$; $p < .001$). Evidence for internal comparisons was provided by the weak, negative effects of English

achievement on math ESRL ($\beta$ = -.045; p = .335), and math achievement on English ESRL ($\beta$ = -.001; p = .999). The English and math ESRL components were significantly, positively correlated (r = .302; p < .001). Taken together, these findings suggest that students give more weight to external comparisons in determining their perceived efficacy for self-regulated learning.

Gender pattern differences were then assessed with two analyses of variance, with gender as a between variable and ESRL and achievement serving as respective repeated measures. Statistically significant interaction effects indicated no gender differences with respect to math achievement and math ESRL, but females scored significantly higher than males in both English achievement and English ESRL (see Table 1). Based upon these findings, separate exploratory path analyses were conducted with the female (N = 170) and male (N = 122) subsamples. The results indicated that all patterns among the variables were consistent with the full model parameters, with the exception of one estimate. Whereas the effect of English achievement on English ESRL was significant and positive for females ($\beta$ = .288; p = .001), this effect was positive but lower for males ($\beta$ = .194; p = .051).

## Discussion

Contrary to findings reported in the self-concept literature (Marsh, 1990), where students use both internal and external comparisons, students in this study tended to use primarily an external frame of reference in determining their perceived capability to self-regulate learning. These students apparently gave more weight to peer-group comparisons than to self or internal comparisons. Further, this focus upon the external process remained invariant across gender. Homogeneously grouping students by ability may therefore have some merit given the influence of external frames of reference in the formation of efficacy for self-regulated learning.

These findings also demonstrate that English and math efficacy for self-regulated learning and achievement may be influenced by analogous processes or evaluated in relation to similar frames of reference. Students' judgments of their capability to learn in one area positively relates to assessments in other domains (Schunk, 1996), which may help explain the interrelatedness of the English and math components across these constructs. It is also

possible that the external comparisons influencing efficacy perceptions and achievement will subsequently influence other achievement-related behaviors, such as setting goals or selecting courses.

Finally, the strong association between the English and math efficacy components may provide some insight into the structure of self-regulated learning perceptions. If English and math self-regulatory efficacy do correlate substantially, a higher-order general efficacy for self-regulated learning cannot be ruled out. In other words, general self-regulatory measures may not need to be replaced with more content-specific measure. Different theoretical models should be tested to determine whether it is justified to subsume domain-specific efficacy measures into a more global measure of efficacy for self-regulated learning.

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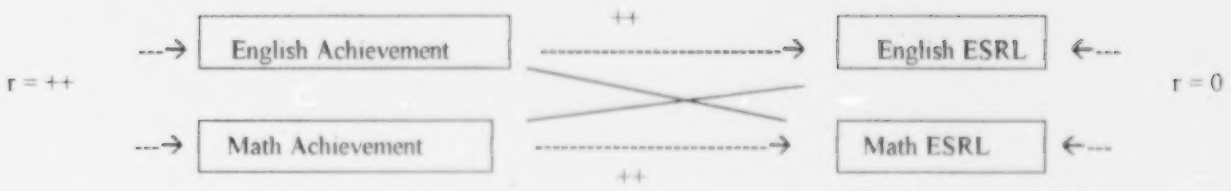
Figure 1

Path Diagram of Predicted Effects for the

Internal/External Frame of Reference Model




Note. Coefficients of "++" are predicted to be high positive, coefficients of "0" are predicted to be approximately zero, and coefficients of "-" are predicted to be low negative.

Table 1

Achievement and Efficacy for Self-Regulated Learning Descriptive Data by Gender

| | Female (N = 170) | | Male (N = 122) | |
|---|---|---|---|---|
| | Mean | Standard Deviation | Mean | Standard Deviation |
| English Achievement | 27.81 | 6.83 | 24.43 | 7.15 |
| Math Achievement | 11.38 | 4.58 | 11.53 | 5.19 |
| English ESRL | 56.75 | 10.19 | 51.30 | 9.85 |
| Math ESRL | 51.38 | 13.79 | 51.70 | 12.96 |